CHAPTER 10

RIGID PAVEMENT BASE COURSES

10-1. General Requirements.

Base courses may be required under rigid pavements for replacing soft, highly compressible or expansive soils and for providing the following.

a. Additional structural strength.

b. More uniform bearing surface for the pavement.

c. Protection for the subgrade against detrimental frost action.

d. Drainage.

e. Suitable surface for the operation of construction equipment, especially slipform pavers.

Use of base courses under a rigid pavement to provide structural benefit should be based on econ.-my of construction. The first cost is usually less for an increase in thickness than for providing a thick base course. However, thick base courses have often resulted in lower maintenance costs since the thick base course provides stronger foundation and therefore less slab movement. A minimum base-course thickness of 4 inches is required over subgrades that are classified as OH, CH, CL, MH, ML, and OL to provide protection against pumping. In certain cases of adverse moisture conditions (high water table or poor drainage), SM and SC soils also may require base courses to prevent pumping. The designer is cautioned against the use of fine-grained material for leveling courses or choking open-graded base courses since this may create a pumping condition. Positive drainage should be provided for all base courses to ensure water is not trapped directly beneath the pavement since saturation of these layers will cause the pumping condition that the base course is intended to prevent. The base course material and drains must meet the drainage criteria listed in TM 5-820-2/AFM 88-5, Chap. 2.

10-2. Materials.

If conditions indicate that a base course is desirable under a rigid pavement, a thorough investigation should be made to determine the source, quantity, and characteristics of the available materials. A study should also be made to determine the most economical thickness of material for a base course that will meet the requirements. The base course may consist of natural, processed, or stabilized materials. The material selected should be the one that best accomplishes the intended purpose of the base course. In general, the base- course material should be a well-graded, high-stability material. In this connection all base courses to be placed beneath concrete pavements for military roads and streets should conform to the fol-lowing requirements:

a. Percent passing No.10 sieve; Not more than 85.

b. Percent passing No.200 sieve: Not more than 15.

c. Plasticity index: Not higher than 6.

Where local experience indicates their desirability, other control limitations such as limited abrasion loss may be imposed to ensure a uniform high-quality base course.

10-3. Compaction.

Where base courses are used under rigid pavements, the base-course material should be compacted to a minimum of 95 percent of the maximum density. The engineer is cautioned that it is difficult to compact thin base courses to high densities when they are placed on yielding subgrades.

10-4. Frost Requirements.

In areas where subgrade soils are subjected to seasonal frost action detrimental to the performance of pavements, the requirements for base-course thickness and gradation will follow the criteria in chapter 18 of this manual.